Roll No. .....

3303

B. Tech. 6th Semester (Civil) Examination – May, 2025

IRRIGATION ENGINEERING

Paper : PCC-CE-302G

Time : Three Hours] *[Maximum Marks : 75*

Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.

Note : Attempt ***five*** questions in all, selecting ***one*** question from each Section. Question No. **1** is ***compulsory***. All questions carry equal marks.

1. Describe the following : $3 \times 5 = 15$

(a) Crop period and base period

(b) Stilling basin

(c) Canal escapes

(d) Requirement of drain

(e) Launching apron

SECTION – A

2. What do you mean by irrigation system and what are the various types of irrigation system ? 15

3. (a) Explain soil moisture relationship with neat diagram. 7.5

   (b) Explain the different water resources in India. 7.5

SECTION – B

4. Define canal fall. Also explain its type with neat sketch. 15

5. What do you mean by hydraulic drainage work ? Explain any two types. 15

SECTION – C

6. Design a suitable section for the overflow portion of a concrete gravity dam having the downstream face sloping at a slope of 0.7H:1V. The design discharge for the spillway is 8000 cumecs. The height of the spillway crest is kept at RL 204 m. The average river bed level at the site is 100 m. The spillway length consists of 6 spans having a clear width of 10m each. Thickness of each pier may be taken to be 2.5 m. 15

7. Define spillway. Explain type of spillway with neat sketch. 15

SECTION – D

8. What is water logging ? What are the causes, effect and prevention of water logging ? 15

9. Define river training. What are the objectives and classification of river training work ? 15

Roll No. .....

3304

B. Tech. 6th Sem. (Civil) Examination – May, 2025

FOUNDATION ENGG.

Paper : PCC-CE-304-G

Time : Three hours] *[Maximum Marks : 75*

Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.

Note : Attempt ***five*** questions in all selecting ***one*** from each section. Question no. 1 is ***compulsory***. All questions carry equal marks. Assume missing data, if any, suitably.

1. (a) What are uses of soil exploration. $2.5 \times 6 = 15$

(b) State three modes of shear failure.

(c) Under what conditions raft foundation is provided ?

(d) How friction piles transfer loads ?

(e) Define immediate settlement.

(f) In what scenarios are drilled piers preferred over other foundation types ?

SECTION – A

2. (a) Explain Static cone penetration test in detail. 10

(b) Describe the salient features of a good sub soil investigation report. 5

3. (a) Discuss in details various well point techniques for dewatering soils. 8

(b) Elaborate vacuum method of dewatering in detail. 7

SECTION – B

4. (a) Discuss factors affecting depth of foundation. 8

(b) Explain in detail effect of Eccentricity on Bearing Capacity. 7

5. (a) What are the limitations of plate load test ? 5

(b) Discuss in detail various causes of settlement of foundations. 10

SECTION – C

6. (a) A square footing 2m × 2 m is founded at a depth of 1.5m below the ground surface with cohesion $c = 20\ kN/m^2$ and angle of shearing resistance $\Phi = 20°$. The unit weight of soil is $18\ kN/m^3$.

Determine the ultimate bearing capacity of the soil b) the net bearing capacity of soil. Use General shear failure. 10

(b) What soil properties influence the bearing capacity of raft foundations in these soil types ? 5

7. (a) Describe how tip resistance and friction resistance of pile can be separately determined by pile load test. 8

(b) Write about piles according to method of installation, based on use, material used and their load carrying characteristics. 7

SECTION – D

8. (a) Describe the various types of caissons. 8

(b) What are the different types of drilled piers commonly used in construction ? 7

9. (a) Describe the various components of a well foundation. 8

(b) Discuss the factors affecting Well Foundation lateral stability. 7

Roll No. .....

3305

B. Tech. 6th Semester (Civil) Examination – May, 2025

HIGHWAY ENGINEERING-II

Paper : PCC-CE-306-G

Time : Three hours] *[Maximum Marks : 75*

Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.

Note : Attempt ***five*** questions in all selecting ***one*** from each section. Question no. 1 is ***compulsory***. All questions carry equal marks.

1. (a) Explain 'flexible and Rigid' pavements.

   (b) Give the equation developed by Westergaard for the tensile stress at the top of the slab due to corner loading.

   (c) What are the functions of priming a road surface ?

   (d) Draw a neat diagram showing various component layers of a CC pavement structure.

(e) Explain the causes of mud pumping in CC pavements.

(f) Define resisting length with reference to design of hill roads. $6 \times 2.5 = 15$

UNIT – I

2. What are the factors to be considered for the design of flexible pavements ? Discuss significance of each. 15

3. (a) What are the objects of providing dowel bars in CC pavements ? Explain. 9

(b) What are the functions of tie bars in rigid pavements ? 6

UNIT – II

4. Explain the objectives, type of material and method of application of : 15

(a) Prime coat

(ii) Tack coat

5. Mention the method of construction and quality control for a granular sub base course. 15

UNIT – III

6. What are the different types of functional deterioration of pavement ? Mention their effects on the road users. 15

7. Explain characteristic deflection and the method of determining the same from BBD data. 15

UNIT – IV

8. (a) What are the requirements of a good highway drainage system ? 6

(b) With sketches explain the special geometric features of hair pin bends. 9

9. Write short notes on : 15

(a) PPP projects in highways

(b) Importance of highway economic studies

(c) Annual cost method of economic evaluation

Roll No. .....

3306

B. Tech. 6th Semester (Civil) (Elective-I) Examination – May, 2025

WASTE WATER TREATMENT

Paper : PEC-CEEL-302-G

Time : Three hours] *[Maximum Marks : 75*

Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.

Note : Attempt ***five*** questions in all selecting ***one*** from each Unit. Question no. **1** is ***compulsory***. All questions carry equal marks.

1. (a) Name the sources of DWF ? $2.5 \times 6 = 15$

(b) What are sewer and sewage ?

(c) Write the principle of house drainage ?

(d) Write is permissible limits of effluents to dispose on land for following parameters - (i) pH (ii) TDS (iii) Turbidity (iv) BOD (v) COD

(e) Name the units for dewatering the sludge ?

(f) What are coagulation and flocculation process in waste water treatment ?

UNIT – I

2. (a) Design a sanitary sewer to a population of 5000 receiving water at rate of 100LPCD. Minimum self-cleansing velocity at design flow is 0.8m/s. maximum depth of flow is 0.5D. assume design data, if missing. 8

(b) Discuss the flow variation and their effects on design of sewerage system ? 7

3. (a) Explain the testing methods of sewer lines ? 8

(b) Describe with the help of neat sketches, types of sewer joints ? 7

UNIT – II

4. (a) Do comparison between one pipe and two pipe plumbing system ? 8

(b) Classify traps? Draw neat sketches also ? 7

5. (a) Discuss the physical and chemical characteristics of waste water ? 8

(b) State the guidelines for reuse of treated waste water ? 7

UNIT – III

6. (a) Design screen, for a waste water treatment plant of 5MLD capacity. Assume any missing data. 7

(b) Write the principle of sedimentation tank ? Mention the factors effecting its efficiency ? 4, 4

7. (a) Describe the types HRTF ? 8

(b) Give a detail on up-flow anerobic sludge blanket process ? 7

UNIT – IV

8. (a) Enumerate the process of aerobic sludge digestion of waste water ? Mention the factors affecting sludge digestion ? 5, 3

(b) Explain the construction and working of sludge drying beds ? 4, 3

9. (a) Mention the modes of disposal of treated sludge ? 7

(b) What is Oxygen - Sag curve ? Discuss. 8

Roll No. .....

3311

B. Tech. 6th Semester (Civil) (Elective-II) Examination – May, 2025

REPAIR & REHABILITATION OF STRUCTURE

Paper : PEC-CEEL-312G

Time : Three Hours] *[Maximum Marks : 75*

Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.

Note : Attempt ***five*** questions in all, selecting ***one*** question from each Section. Question No. **1** is ***compulsory***. All questions carry equal marks.

1. Describe the following: $3 \times 5 = 15$

(a) Repair Materials

(b) Cracks

(c) Upgrading of Structures

(d) Interpretation of Cracking Pattern

(e) Durability

SECTION – A

2. (a) Explain the global scenario of distressed structures. 7.5

(b) Why it is necessary to upgrade the structure ? 7.5

3. Explain in detail design & construction deficiency like overloading. 15

SECTION – B

4. Explain the procedure of measurement of cracks and interpretation of cracking phenomenon. 15

5. Explain the Field & Laboratory Testing Procedures for strength and corrosion determination. 15

SECTION – C

6. Explain the criteria, selection of repair material and methodology of repairing of structure. 15

7. (a) Explain the needs of retrofitting in detail. 7.5

(b) Explain the conventional and advanced techniques available for strengthening. 7.5

SECTION – D

8. Explain all the categories of maintenance of structures used by civil engineer. 15

9. (a) Explain the components of structural health monitoring (SHM) and its working mechanism. 7.5

(b) Explain the working of structural health monitoring as a tool for proactive maintenance of structures. 7.5
